

BTC response to the Highways England’s response to RHS document Appendix 3 [REP8-045] - Letter from Barrell Tree Consultancy to Royal Horticulture Society [REP7-042]

HE comments	BTC response
3.1.1 Highways England (HE) has considered the letter dated 17 April 2020 from Barrell Tree Consultancy to the RHS submitted by RHS at Deadline 7 [REP7-042].	
3.1.2 The letter is heavily caveated as regards to the information considered by Mr Barrell in reaching his conclusions. He refers to the two documents he has seen and stresses that he has not visited the site or seen the trees.	I was not able to visit the Site because of the COVID-19 government restrictions. I have now visited, and I have seen other relevant documents. The conclusions in my previous Report still stand.
3.1.3 He refers to his concerns about a number of omissions, numbered 1-7.	
3.1.4 As regards points 1, 2, 3 and 5 all of these are addressed in Appendix 7.3 of the environmental statement [APP-089] the Veteran trees and Arboricultural Impact Assessment. Mr Barrell makes no mention of having considered this document and presumably he has not done.	I have now seen Appendix 7.3 and it does provide the information that I mention in my points 1, 2, & 3.  However, it does not fully address the points that I raise in my point 5, namely the issue of the “structural root zone”. This phrase and the approach it entails is founded in largely irrelevant literature from the USA and Australia. It has no basis in the UK literature because there is the BS 5837 (2012) <i>Trees in relation to design, demolition and construction – Recommendations</i> , that deals with all the issues that are relevant in a UK context through the root protection area approach. This is a far superior approach because it deals with impact on tree health and stability, whereas the structural root zone approach only deals with tree stability. My report submitted with D10 submissions addresses this issue fully.
3.1.5 Sections 7.2 & 7.4 of Appendix 7.3 cover the method of recording and the analysis of the tree data captured. This addresses <b>point 1</b> in Mr Barrell’s letter.	Noted
3.1.6 Appendix B of Appendix 7.3 addresses <b>point 2</b> in the letter. The Appendix contains the Scheme wide tree survey schedule. This includes the RHS trees recorded in this location and details all tree data collected in accordance with BS 5837 requirements.	Noted
3.1.7 Section 7.2, paragraph 7.2.1.1 of Appendix 7.3 confirms that the tree survey was carried out by experienced and qualified arboriculturists’. This addresses <b>point 3</b> in the letter.	Noted

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3.1.8 Appendix A, section A.2 of Appendix 7.3 explains how trees were measured to inform the root protection area calculations. This addresses <b>point 5</b> in the letter.	Noted
3.1.9 Section 7.4, paragraphs 7.4.7.1 to 7.4.7.5 of Appendix 7.3 explains that Highways England’s arboriculturists identified 7 trees within RHS Wisley at risk of removal. These being tree reference numbers T197, T192, T185, T184, T181, T183 & T176. The trees were potentially affected due to the extent of the earthworks required within the A3 verge. This included the two redwood trees (T184 and T183) that are of particular concern to RHS.	Noted
3.1.10 In November 2019 Highways England’s arboriculturists undertook a further detailed assessment in order to establish the lateral extents of mappable tree roots around the trees and how the Scheme would impact upon them. This involved mapping the rooting areas of the trees using impulse technology, an innovative approach used in the Thames Tideway scheme and during the construction of the A14 Cambridge to Huntingdon Improvement Scheme.	I have dealt with this in my Report on tree root investigations, submitted with the RHS D10 submissions REP10-xxx. I conclude that this is a new and unproven technology, and the evidence provided in that Report confirms that it cannot be reliably used to assess the impact on these trees.
3.1.11 The results of this survey work informed the documents referred to by Mr Barrell. However, a technical note produced by Highways England’s arboriculturists that included the method, outputs and conclusions of this assessment has not been submitted to the examination to date and these conclusions were used to inform the proposed design modification (within limits of deviation shown on the works plans) mentioned in the report to which Mr Barrell refers (i.e. HE551522-ATK-HML-A3_J1-RP-CH-000001).	This approach is flawed and cannot be relied upon as a credible design tool. Furthermore, there is no UK-oriented UK reference that supports this approach, and the rather obscure international references are dated and not relevant to the UK planning environment.
3.1.12 This technical note is appended to this response and covers an assessment of the impacts from the works as originally proposed in this location, namely a retaining wall structure and extensive works in the A3 verge as part of the A3 widening in this location. The technical note also addresses <b>point 4</b> of Mr Barrell’s letter regarding the explanation of the phrase ‘structural root zone’.	The Technical Note does not provide a competent assessment of the impact on trees because it is based on a flawed approach to estimating where the important roots are, as revealed in my <i>Root excavation Report</i> . The explanation does not address my point 4. It is not a credible explanation because it relates to American research

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	dated 1994, 1998, and 2002. This is all superseded by BS 5837 published in 2012 and there is no reference in this document to “structural root zone”.
3.1.13 The modification proposed relates to a requirement in the dDCO to protect them, namely requirement 18 [REP6-003]. The requirement restricts intrusive works except with the consent of RHS within certain areas related to the trees, namely the area containing the mapped root zones along with a 1m offset.	My <i>Root excavation Report</i> confirms that the mapped root zones are unreliable and cannot be credibly used to assess the impact on trees. This means that HE has not properly or competently assessed the impact on trees, or provided any adequate provision to protect important trees. This is all contrary to the Recommendations set out in BS 5837.
3.1.14 Highways England agrees with Mr Barrell regarding the root protection area (RPA) capping at 15m according to BS5837. Highways England’s arboriculturists did not apply at cap of 15m because RPAs can be modified in line with the BS5837:2012 guidance to take into account conditions not conducive for tree root growth, such as (in this case) the A3 and existing hard infrastructure. The realignment proposed in this location minimises/removes construction within the verge and any impacts on the RPAs of the trees.	These assertions are not correct. From my measurements, the BS 5837 RPAs extend right up to and beyond the existing kerb edges in most instances. There are no credible grounds that I am aware of that could reasonably be used to modify these RPAs to any significant extent within the recommendations set out in BS 5837. Furthermore, the RPA is intended as an area where any significant disturbance should be avoided, but that is not the case from my understanding of the plans. It seems that there will be significant excavations and changes in levels within the RPAs of all these trees, and those will have serious consequences for the health and stability of those trees. Indeed, the Atkins Technical Note in Section 6 in row 7 states that there is a “ <i>Very High</i> ” risk of the works de-stabilising five of the seven important trees. I agree with that assessment, which confirms by HE’s own assessment that trees will be harmed to the extent that they will be severely compromised with no viable pruning options.
3.1.15 The further investigations that were conducted went above the consideration of the RPA as given in BS 5837:2012 in order to gain a better understanding of the lateral spread of the larger roots associated with stability and the storage of starch. Consideration was given to the lateral extent of the mapped root zone to augment, but not replace, the consideration of the RPAs. The use of the impulse technology allowed Highways England to better understand the root systems of the trees. It establishes a radial extent of tree roots of 25mm diameter and greater, to allow detailed analysis of the impacts of the works on the structural integrity of the tree. Roots of 25mm diameter and	As confirmed in my <i>Root excavation Report</i> the further investigations were flawed and, contrary to the assertions in 3.1.15, went well below the standards set out in BS 5837. Indeed, they were positively misleading and have resulted in poor quality information being given weight it does not deserve. The point about starch is simply nonsense that does not stand up to any credible examination. I agree with the literature and the HE statement that roots “ <i>Roots of 25mm diameter and greater are those considered essential to the tree’s health and stability</i> ”, which is why any credible and serious assessment would seek to know where they are. This new technology has failed to deliver this essential requirement, which has produced

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<p>greater are those considered essential to the tree’s health and stability, hence the need to determine where these are located. Roots of less than 25mm diameter are generally considered to be primary functioning for water and mineral uptake, and these could extend beyond the mapped areas. However, within the BS5837 it is recognised practice that such roots can be trimmed where needed, and if clump forming only on the advice of an arboriculturist.</p>	<p>misleading and inadequate information for any reasonable, balanced, and credible decision-making process.</p>
<p>3.1.16 Mr Barrell questions the use of the phrase ‘structural root zone’. Whilst this phrase is not mentioned in the BS5837 recommendations, it’s use is explained in the technical note appended to this response and was relevant in understanding the impact of the proposals on the structural integrity of the trees. The 1m depth of the structural root zone indicated in the drawing of document REF HE551522-ATK-HML-A3_J1-RP-CH-000001 was included to demonstrate the working depth of the impulse tomography equipment used, rather than the depth of the structural root zone measured.</p>	<p>The phrase “<i>structural root zone</i>” is not used in the BS because it is not necessary to know and has little relevance to the understanding of the impact on trees. The 1m depth limitation of the technology is a serious flaw because, contrary to the dated texts referenced, there is now accumulating evidence that large trees of certain species can extend significant roots down to depths of many metres. The idea that the bulk of tree roots are confined to the upper part of the soil profile is proven to be a gross over-simplification that cannot be relied upon without proper interpretation of the local circumstances.</p> <p>The local circumstances here are a free draining soil where facultatively deep rooting species, of which we know redwoods and poplars are, have the potential to put roots down deep. There is an implication here because deep excavations with the existing highway footprint could adversely affect roots beneath the current formation depths within the existing footprint of the carriageway. I have seen no evidence that this has been considered in the analysis.</p>
<p>3.1.17 The protection measures for these trees are to be detailed within an arboricultural method statement (AMS) required as part of the CEMP required to be approved under Requirement 3 of the Draft DCO. This will include updating the tree protection plan to show the locations of any protective barriers or ground protection. The AMS will also detail the requirements for monitoring and supervision by an arboriculturist. This addresses <b>point 6 &amp; 7</b> in the letter.</p>	<p>I agree that they can be retrospectively prepared, but that can only be on the basis that there is a reasonable prospect that proposed works will not adversely affect the trees, and that has not been credibly presented in any way.</p> <p>At the present time, by the Atkins assessment, and my review, at least five of the seven important trees identified cannot be retained without serious adverse impact on their health and prospects. Although they will not die immediately, they will be de-stabilised to the extent that they will have to be immediately removed for safety</p>

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	<p>reasons as they are within falling distance of the A3 and the public visiting Wisley Gardens.</p> <p>This is contrary to the thrust of the HE assessment shown in the schedule and plan of Appendix 7.3, that identify these trees as being for potential removal, when there is no realistic prospect that they can be retained if the works are implemented as shown.</p>
<p>3.1.18 Mr Barrell’s conclusion that the analysis undertaken by Highways England is not credible or fit for purpose is wrong and has been formed without his reviewing all available documentation or requesting any further information.</p>	<p>As confirmed in my <i>Root excavation Report</i>, the data upon which the decisions have been based is seriously flawed because it does not realistically show where important tree roots are located. Contrary to HE’s assertions, my investigations have confirmed that its analysis is not fit for purpose because it has not properly or competently assessed the impact on trees according to the Recommendations set out in BS 5837, i.e. based on the extent of RPAs.</p>